

tence was penned. The following description of the horn of the rhinoceros is however quite beyond our comprehension:—"The head weapons are solid horny projections of the nasal bone, which rise into a flat hump within equalities of the bone substance. From this characteristic feature it can in most cases be determined whether the fossil animals of the rhinoceros species possessed horns" (p. 194).

There is so much solid and useful information in the work, brought down to the most recently-published researches, as, for instance, those of Nehring, Branco, and Piétrement on extinct horses, that, if it had been subjected to careful revision by any one conversant both with the subject and the English language, it would have made a popular and readable manual of great educational value.

W. H. F.

OUR BOOK SHELF

Chemistry of the Non-Metals. By E. B. Aveling, D.Sc. (London: Joseph Hughes, 1886.)

DR. AVELING tells us in the preface that "few people have as hearty a dislike for the whole system of examinations as himself. Theoretically, the object of the acquisition of knowledge is the bettering of human conditions. Practically, to-day the end and sole object is the passing of some examination"; after which the subject is shelved indefinitely in perhaps most cases. This seems to be the author's opinion, and it is doubtless correct in the main. But people who have even learned enough "to pass" one of the examinations the author names—the Matriculation (London) or the Elementary Stage (South Kensington)—must surely be in a better condition than before, spite of the inane questions the author speaks of as being set.

The extent of the book is to the so-called non-metallic elements only, their preparation, reactions, &c., and questions, including arithmetical problems, follow each element treated of.

The plan is very complete, perhaps too complete, for very young students such as we have nowadays. For instance, under the heading of each element is given—(A) Symbol, (B) weight number (atomic weight), (C) preparation, with several methods *in extenso*, (D) properties, with further numerated subsections 1 to 6, &c. Even Greek letters are used for "planning out" a property of a substance, &c.

Although the author starts by telling us how he dislikes examinations, his little book is eminently meant to cram students up for them. It is evidently intended to be used as a class-book, so that the beginner will have the assistance of a teacher to make a beginning.

There are a few misprints, and the descriptions are obscure in places.

Why do people who write little books always begin with hydrogen? In this book we begin with hydrogen, valency, ice, water, steam, latent heat, ammonia, and then come to oxygen, which has been spoken of as if we knew all about it. We certainly think, with most German teachers, that it is most logical to commence with oxygen and nitrogen and the atmosphere. There is much less knowledge of other substances to be assumed.

Hand-book of Mosses, with an Account of their Structure, Classification, Geographical Distribution, and Habitats. By James E. Bagnall, A.L.S. (Swan Sonnenschein and Co., 1886.)

THIS little book is a popular, but on the whole accurate, account of the best-known British mosses. The chapter on development, usually the weakest part of hand-books of this kind, is better than usual. We must however call

attention to the confusion between "cuticle" and "epidermis" on p. 19, and to the unnecessarily bewildering description of the development of the spores on the following page.

The longest and also the best chapter is that on moss habitats, containing a very clear general description of the most important species, arranged according to the localities in which they are to be found. The following chapter, that on classification, is certainly not up to date, but perhaps the arrangement adopted is not intended for a natural one. The remaining sections, on distribution, cultivation, uses, and the preparation of specimens, are slight, but good as far as they go.

The book ought to be useful as an introduction to the systematic study of mosses.

D. H. S.

The Tourist's Guide to the Flora of the Alps. By Prof. K. W. v. Dalla-Torre. Translated and Edited by Alfred W. Bennett, M.A., B.Sc., F.L.S. (Swan Sonnenschein and Co., 1886.)

MR. BENNETT has introduced to English tourists a most convenient and useful Alpine flora. It is issued in a handy pocket-book form, and ought to be very popular with all travellers who take any interest in plants. The author had originally excluded the "commonest and most ubiquitous plants," but some even of these have been added by the translator, and all those natives of the Alpine districts which are not described in the flora proper will be found enumerated in an appendix.

Only two suggestions occur to us. Might not the often difficult work of identification be facilitated by the introduction of one or two analytical tables, such as those in Wünsche's "Schul-Flora von Deutschland?" They need not much increase the bulk of the book. And secondly, might it not be better, in a work intended for English tourists, and not for scientific men, to substitute English measures for those of the metric system? The latter ought by this time to be equally familiar with our own to educated people, but as a matter of fact we fear they are not so.

D. H. S.

Newton: His Friend: and His Niece. By the late Augustus De Morgan. Edited by his Wife and by his Pupil, Arthur Cowper Ranyard. (London: Elliot Stock, 1885.)

THE nucleus of the volume entitled as above was formed by an article written in 1858 for the *Companion to the British Almanac*. Its rejection brought to a close the remarkable series of Prof. De Morgan's contributions to that publication. The undivulged article, however, as years went on, grew by gradual accretions to the proportions of a book, now at last posthumously given to the world. Its primary object is to clear the character of Newton from the odious imputation of having countenanced immorality for the sake of personal advancement. This, in our opinion, has been satisfactorily attained. The researches here embodied afford strong grounds for the persuasion that there was no immorality to countenance. The sneer enshrined in No. 21 of Voltaire's "Lettres Philosophiques" (1765) thus at last loses its sting.

Catherine Barton, the "famous witty Miss Barton," as she was called in the *Gentleman's Magazine*, was the daughter of the Rev. Mr. Barton, by Hannah Smith, Newton's half-sister, and was born in 1680. Educated at the charge of her uncle, she came to keep house for him in London a year or two before 1700. Her beauty and brilliancy were the talk of the town, and won her the homage of men eminent for position and parts. She was amongst those whom Swift "loved best"; "j'ai conservé" Remond de Montmort wrote in 1716, "l'idée du monde la plus magnifique de son esprit et de sa beauté;" Charles Montague, Earl of Halifax, formed for her a devoted and life-long attach-

ment. There is, in fact, strong presumptive evidence that she became his wife nine years previous to his unlooked-for death in 1715. The position, it is true, was never explicitly claimed by or for her; but silence might easily have been imposed by the inferiority of her social position. At any rate, a letter written by Newton to his kinsman, Sir John Newton, May 23, 1715, admits of but one interpretation. It includes the following sentence:—"The concern I am in for the loss of my Lord Halifax, and the circumstances in which I stand related to his family, will not suffer me to go abroad until his funeral is over." No "circumstances" existed which could possibly explain this allusion save one—that of a marriage between the deceased nobleman and the writer's niece. The words are used with no purpose of disclosure; they treat the fact they bear witness to as a known and indisputable one—known, that is, to an inner circle, where Catherine Barton moved all her life with the respect due to an unblemished character. Handsomely provided for by the will of Lord Halifax, she married, in August 1717, John Conduit, M.P., Newton's subordinate, and afterwards his successor at the Mint, and died in 1739, leaving an only daughter, ancestress of the present Earl of Portsmouth.

A considerable amount of elucidatory information regarding the marriage-laws and social usages of the last century adds to the value of the little work edited by Mrs. De Morgan.

Numerical Examples in Heat. By R. E. Day, M.A. (London: Longmans, Green, and Co., 1885.)

THIS is not merely a collection of numerical examination questions with the answers attached, but a well-arranged series of problems grouped under twenty-five heads, each beginning with simple questions, which increase in complexity. At the first introduction of every kind of question the answer is worked out in full, with a sufficient explanation to show the meaning of the operations. Other questions are given with their answers, but without the process of solution.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Note on Sonnet to Pritchard

IN the general theory of algebraical forms there are two modes of defining an Invariant or Reciproquant. In the one mode either of them is regarded as subject to satisfy a partial differential equation—in the other as subject to extinction under the action of a partial-differential operator. Of course the difference between these two modes is one of presentation merely, and not of substance. Nevertheless it was interesting to me to observe that the very same rival concepts of *equality* and *extinction* lie at the root of the admirable investigations simultaneously carried on by Prof. Pickering at Harvard (who works by equation of light), and Prof. Pritchard at Oxford (who works by the method of extinction), which have earned for each of them the distinction of the award of the gold medal of the Royal Astronomical Society. I say the gold medal, because the medal to each is to be regarded in a transcendental sense as only one to both.

This reflection added to the sentiments of regard which I entertain towards my Savilian colleague caused me to write the sonnet in his praise, which you have done me the honour to insert in NATURE (April 1, p. 516), in which, owing to my own inadvertence the words *name* and *praise* have got interchanged. Being desirous that this tribute of unaffected admiration towards the subject of it should be affected with as few blemishes as are compatible with the feeble versificatory powers of its author, I request to be allowed to say that the first and last lines should read—

Pritchard! thy name is lifted to the skies,
and
Thy praise shall flourish in immortal song,

respectively. Also that the third and fourth lines should run thus—

To note each ray that gilds the hem of Night
Or eye her jewelled brow with keen surmise.

At the dinner of the Fellows of the Royal Astronomical Society on the evening of the public presentation of the Medal to Prof. Pritchard, the sonnet was recited by its author at the desire of the Astronomer-Royal, who presided on the occasion.

J. J. SYLVESTER,
Savilian Professor of Geometry in the University of Oxford; and Author of "The Laws of Verse"

Fishery Board of Scotland

YOUR leading article of the 1st instant, headed "A Fishery Board for England," contains several inaccuracies with regard to the Fishery Board of Scotland which it appears desirable to correct.

(1) "If a Fishery Board is useful and valuable, it is a surprising fact that Ireland and Scotland have long enjoyed an institution which is wanting in England."

The present Fishery Board for Scotland was constituted only in 1882. Prior to that date there was a Board of Fisheries which, from its origin in 1808 until 1820, confined its attention to the curing and branding of herrings, and to collecting statistics of the quantities of herrings landed and exported. From 1820 to 1881 statistics of the cod and ling cured were also prepared. This Board of Fisheries having charge of all the fisheries around the coast of Britain, appointed officers at the chief Scottish and English fishing ports, two of whom were stationed in London, from which in the beginning of the century large consignments of herring were sent to the Continent. In course of time the number of herrings cured at the English stations became so small that in 1850 the English Fishery officers were dismissed. In fact, the old Fishery Board existed chiefly in order to collect statistics of cured fish and to superintend the curing and branding of herrings. It will be understood how exclusively attention has been devoted to these objects when it is mentioned that even now the Fishery officers must be practical coopers.

(2) "The Commission for the Investigation of the German Seas is composed of distinguished men who are students and teachers of biology or physics. In Norway and Holland the same thing occurs."

We believe it is a fact that neither the Norwegian nor the Dutch Government has yet instituted Fish Commissions.

(3) "A large number of matters connected with the fisheries have not yet begun to receive attention even in Scotland."

It was only in 1883 that the Scottish Fishery Board obtained from the Government a sum of 300*l.* for studying the life history, &c., of the food-fishes, and the total sum received up to the end of last month was only 280*l.* When it is remembered that a sum of 10,000*l.* has been required to found the laboratory of the Marine Biological Association, it can scarcely be deemed a matter of surprise that many topics of interest and importance have not received from the Scottish Fishery Board that degree of attention which they deserve.

(4) "The spawn of the sprat is still entirely unknown."

Mr. Duncan Matthews, of the University of Edinburgh Zoological Laboratory, in his "Report on the Sprat Fishing during the Winter of 1883-84," published in the Report of the Fishery Board for Scotland for 1883, describes and figures the "spawn" of the sprat.

(5) "The Scottish Fishery Board is about to try an extensive experiment with regard to beam-trawling, prohibiting that method of fishing in certain defined areas. The experiment is worth trying, even at the cost of temporary inconvenience to the fishery industry. But in order to render such an experiment fruitful, it would be necessary to make a detailed and exact investigation of the areas selected. It is doubtful whether the organisation of the scientific department of the Scottish Board is yet in a position to make this investigation in a sufficiently complete manner."

Seeing that he appears to speak as one having authority, and not as the scribes, it is gratifying to note that the writer of your article deems "the experiment worth trying." We have only